Joined-up Library and Information Services in the University of the 21st Century

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Introduction

Our present Prime Minster, Tony Blair, has coined the phrase 'joined-up government'. This is intended to mean that government departments and ministries do not fight with each other over policies where the departmental responsibilities overlap; nor do they ignore the areas at the cracks. The British Government is tackling such matters as rural economy and family breakdown which cut across ministries in this way[1]. It is not centralisation: the units remain but methodologies are put in place for ensuring their policy is not contradictory. 'Joined-up' is currently a fashionable expression.

This paper illustrates how library and information services are becoming joined-up in their constituent parts and are using various methodologies to ensure they are efficient and their parts work in a coherent manner.

The University in Transition

In Britain, some years ago most universities were built on a single site and did a range of clearly defined subjects. Students studied a course such as history and within that there were many options but they were all controlled by the history faculty. Teaching was usually on one site. Things are changing. Now, universities are adopting a modular approach to courses. Students can mix modules from different faculties. Many universities have expanded or taken over other institutions. Art used to be studied in Colleges of Art, nursing was not a degree but training was in hospitals and nothing to do with universities and teachers were trained in teacher training colleges. Even universities built originally on single sites have taken over the specialist colleges. Nursing training is now attached to universities but the hospitals where they work remain where they are. Middlesex University has at present 13 campuses because there has been a continuing process of absorbing colleges since 1971. Middlesex was formerly a polytechnic and at a stroke in 1993 all the polytechnics became universities. Many other universities are in a similar position with many separate sites, though in a large number there are moves to reduce the number of campuses on economic grounds. We are planning to do the same in Middlesex: to move from 13 locations to 7 locations four of which are actually in hospitals for nursing education and therefore cannot be dispensed with as nurses need to be taught on the sites where they work as trainees or as qualified nurses if they are doing advanced courses.

But broader choice of subject and merging of institutions are not the only reasons why universities are in transition. Government policy intends that more students attend university. As well, universities are participating in government life-long learning initiatives (in Middlesex we have renamed the School of Education 'Lifelong Learning and Education'). Universities are moving from an emphasis on teaching to an emphasis on learning. These initiatives are a response to the growing increase in the speed of technological change, which compels workers to retrain for new skills throughout their lives. Middlesex University also has courses in work-based learning where the university develops degrees, both undergraduate and postgraduate. People's accumulated expertise is rarely recognised or measured – let alone awarded a formal academic qualification - yet the recognition of students' informal or work based learning can enhance the formal programme they undertake and further career development.

How all this expansion in higher education is paid for is an issue in the UK since student numbers have increased without a corresponding increase in funds. Moreover for UK and European Union undergraduate students, who make up the largest group of students, there are set fees prescribed by government which cannot be changed.

Another interesting development has occurred in universities over the last few years. Universities have been busy making partnerships. Middlesex University for example has co-operative arrangements with further education colleges in its area. It has also made links with universities and institutes in other countries, Thailand, Malaysia, Egypt to name just a few.

[1] "The cafetiere theory of government: Whitehall's cultural revolution: In opposition, Tony Blair remade the Labour Party. In office, he is reinventing Britain's system of government" *Economist* (21 Aug 1999), p.2486

These arrangements are not the same as those for distance learners. This is another area of business which universities have been exploiting recently. They run courses for students who are never expected to attend, other than perhaps a summer school. They might attend a local college but a university with a much more famous name is awarding the degree. Some US universities have gone for this in a big way. More often universities are setting up a small number of distance learning courses and are also expected to provide certain distance learning facilities to postgraduate students such as doctoral students and other categories who seldom need to visit the university.

Universities also have very powerful computer networks both internally and externally. In the UK we have a network called SUPERJANET looked after by UKERNA (the UK Education and Research Network Association)[2]. This replaced an earlier JANET (Joint Academic Network) which was originally supplied as a private network by British Telecommunications dating from the 1970's. After a public procurement that began in December 1999, UKERNA finally signed in June 2000 a contract with WorldCom for a new national backbone running at 2.5Gbit/s (this is 16 times faster than the previous JANET backbone) which was implemented in March 2001[3]. By the end of 2001, the technology in use will move to Dense Wavelength Division Multiplexing (DWDM). This is fairly new technology that is rapidly developing and enabling substantial increases in the bandwidth that can be provided down a fibre. The advantage to JANET of using DWDM is that it can increase the bandwidth available simply by upgrading the equipment on the fibres. This will lead to an upgrade of the backbone to 20 gigabit per second by the middle of 2002. This network is very important to library services because it means that information available elsewhere on the network can be accessed very quickly. Some electronic information providers have UK academic addresses (.ac.uk addresses) to enable the UK academic network users to access their resources at great speed. The associate colleges mentioned above in some cases obtain their internet access through Middlesex University's links to JANET. So as far as the physical network in the UK is concerned, we are very joined-up!

University Libraries

This moves us on to the libraries which are vast consumers of university budgets second only to the cost of the IT infrastructure. Not only do increasing numbers mean an increasing demand on resources but also entail a shift in the people with whom students have contact from academic staff to learning resources staff. This doubles at least the resourcing required but not necessarily doubles the number of staff available. This has called for increasing efficiency in university libraries. In the United Kingdom, the most important milestone was the publication of the Follett report in December 1993 by the Higher Education Funding Councils of Britain[4]. This addressed the future of libraries in higher education institutions, taking into account the diversity of what existed then. One issue was space. Libraries might cooperate in stocking lesser used materials and find other innovative ways to save space and indeed make other savings relating to resources.

One key area of concern was with Information Technology which had already begun to have a great impact on learning though not as great as it has now. Part of the proposals of Follett suggested the investment of 20 million pounds sterling over three years to promote the use of IT in selective areas. This resulted in the setting up of what became known as eLib, the Electronic Libraries Projects which is overseen by JISC, the Joint Information Systems Committee[5]. This work has furthered the development and indeed the application of standards in areas relating to electronic publications and cross-system catalogue searching. This has been heavily supported by UKOLN, the Office for Library and Information Networking, which was the successor to the Centre for Catalogue Research at the University of Bath[6]. Also included were retrospective conversion of card and other printed catalogues with national value and five projects to experiment with and demonstrate interoperability of catalogue systems.

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[2] Information available at http://www.ja.net.

[3] "SuperJan will speed up virtual exchange" *Times Higher Educational Supplement* **1480** (30 March 2001), p13

[4] Joint Funding Councils' Libraries Review Group. report / Higher Education Funding Council for England, Scottish Higher Education Funding Council, Higher Education Funding Council for Wales, Department of Education for Northern Ireland; [chair Sir Brian Follett]. Bristol : HEFCE, 1993. 83p

[5] 'Joint' refers to joint between libraries and computing.

[6] UKOLN UK Office for Library and Information Networking. *UKOLN [Website Home Page]*. Bath: UKOLN, 2001. http://www.ukoln.ac.uk. Useful source of information on their and other related activities

Copyright and rights management in general was seen as an issue and funding was put into research on the legal and practical aspects of copyright.

Convergence

Even before the Follett report was published, many universities were converging their libraries, audiovisual and media services and information technology services. This was done to a lesser or greater degree, but there are now few universities where what used to be the university library service does not now include academic computing support. At one extreme, in some universities, administrative computing and the IT infrastructure are part of a service which includes the library, archives, language laboratories and even study skills and English language learning which are not regarded as academic enough to be in the university's academic departments. Students can go to one point in a Learning Resource Centre and get advice on any kind of learning materials including use of computers for many different learning purposes. Indeed this is one of the main keystones of the joined-up learning resource centres as we call library service points in many universities today. That is the situation at Middlesex University where academic computing support, audio-visual services and the Language Centres (as well as key skills training, about which more below) are part of the department headed by the university librarian. In our environment, with many library buildings inherited from other institutions and not built as the grand free-standing academic libraries you might recognise in places like Oxford, Cambridge, Sussex or University of Kent at Canterbury, some aspects of convergence are easy and some are difficult. Students who need help do not want to have to go from one service point or counter to another to seek it. If they want to know where information is to be found they do not wish to have to go to a computing advisor desk if it is on a CD ROM or a website or a library enquiry desk if the information is in a reference book. They want to be able to go to one enquiry point. The main problem with 'convergence' is seen to be in multiskilling. Staff working in a library need to know how to search computer databases. In short they need to feel at home with computers and to do this probably think they need to be at least level with the students if not a step ahead. This requires good training. But as we say in English 'You can't teach a dog new tricks' and some librarians with perhaps a vast knowledge of their subject area feel that they have been deskilled by having to operate in a world of new media. In smaller libraries reorganisation, of furniture and of the processes which take place behind the counter, has to take place in order to bring together what had been computing support desks and the library desk. Although it might seem trivial to an outsider, many discussions have gone on about how you arrange these desks. Do you have computer advisor at one end and librarian at the other? In libraries organised according on a departmental basis according to subject there will be differences between them in both staff and students' computing abilities.

Having a converged service helps particularly with activities like searching the catalogue which can require library and computing knowledge, depending on what is retrieved. Almost all commercial library systems now have a web interface for accessing the OPAC. So, to a student, his or her own university's library catalogue, that of another university and an external journal article database may all look as though they are 'in the library'. If students get problems accessing the catalogue from home it may be a computer matter rather than being a problem with the catalogue. It is in any case now the norm to link to electronic resources from the catalogue so that the user is taken directly to the file containing the journal articles, which may be on the other side of the world. Problems with access to these resources may be a problem better understood by someone with technical computing knowledge. Having library and computing staff working together in close proximity helps each group to learn about the other's skills and give a better service all round to the library users. Incidentally, though potentially all the world's electronic resources on the internet are accessible from the catalogue terminals, many libraries have certain machines with restrictions to ensure that there are enough computers available for catalogue users and that all of them are not occupied by students reading journal articles or even for that matter using them for email! So a joined-up information resource is there for us to have but there are very many practical problems in achieving it.

The librarian as trainer

Librarians, and I mean anyone at the information desk we have already spoken of, are also becoming increasingly involved in the teaching of key skills. If it is not done by information desk staff it is done within the learning resource centres and the staff at the information desks are often the first point of enquiry about these. Using computers, preparing bibliographies, mathematical skills, English writing skills and English for

Academic Purposes particularly for students for whom English is a second language are all part of this. Additionally there are those skills which form the basis of using a library which perhaps librarians have always undertaken, such as how to use the catalogue, how to find information in periodicals, and so on. In some instances in the past, pointing students in the direction of key skills would have been the responsibility of the students' lecturers. Increasingly as lecturers have more students per head, the job of pointing students in the right direction falls to the resource centre staff who have usually accepted it willingly as part of their role.

The electronic library

As we have just seen, convergence of libraries and computing advisory services came upon the academic library world because so many resources used by library users need computers, and because the occasional help required for computer applications is probably just as well delivered by a helpful librarian who has been trained as it is by someone in a backroom writing computer programs. The electronic library has however come upon us for a number of different reasons.

1. Electronic journals

Many data sources, such as journals, which used to be in printed form, are now available only in electronic form. Others are in both, but there are advantages in having the digital form. For example, it is easier to search an article from an electronic journal for particular topics, it is possible to see it without going to the library and, of course, it is easier to copy the data. Copyright law covers electronic library material in the same way as printed material, but the license taken out between the electronic journal supplier and the university institution governs what can or cannot be done. Students can always copy material for their own use and present it in their essays but they should not, ethically as well as legally, pass it off as their own work without reference to the source. In general, then, electronic data is probably the preferred medium for the user for journal articles today. From the librarian's point of view, it takes up no space and does not need shelving after use. But there are many difficulties at all parts of the supply chain in ensuring a good service. Firstly, librarians and publishers are accustomed to having a hard copy to hold in their hand to send or receive. Many journal publishers still send this hard copy and regard the electronic form as subsidiary and when the journal is actually available in electronic form is anyone's guess. There is no systematic informing of its 'arrival' as there is with a hard copy which 'announces itself' and is registered in a database by journals staff. Other journals can only be accessed on payment of an extra charge which is difficult to justify when budgets are so tight. Suppliers also have to enable permission to access a journal or any other electronic resource. Most publishers mount their digitised journals on a third party's computer. The third party are the supplier of the data and need to know who is allowed to access and how. Many problems arise here, as journal suppliers are not very interested in working hard to provide the free access. There are also different ways in which the free access can be facilitated. One is by IP (Internet Protocol) address. The host computer knows the IP address of the computer accessing and can allow or prevent access by ranges of IP address. At Middlesex University, we have our own dial-up facility so that students accessing by that means can get the IP-validated resources from home since their computer at home will be allocated a temporary IP address. Some systems provide as their preferred method of authentication or as an extra for when IP is not appropriate passwords which can be given out to students; and in the UK we also have the Athens authentication system[7] whereby the university can give each student a password which will then allow access to the resources accessible to the university from those providers which participate in the Athens system. There are many points at which the system can fail to provide end users with the access to which they are entitled. Additionally (and this is worrying very much librarians in Higher Education at present) if you stop subscribing to a journal will you be able to get at the volumes in electronic form that you did pay for?

As I have indicated a good job is not being done (and I have mentioned only a fraction of the problems), since many of the suppliers do not have a commercial interest in making the electronic versions available. A few commercial services are trying to do a good job and are also providing indexes to the journal articles they cover. When the library user accesses an article in a journal, which his library does not take, he will be asked to pay for sight of the article by credit card in order to gain access. It could be very unfair if a journal were supposedly available but not in fact available, either because of incorrect usage by the user or careless validation by the data supplier. We estimate this happens frequently.

[7] *Athens Access Administration System.* Bath: Athens Service, 2001. http://www.athens.ac.uk

Other ways of providing the service might emerge in the future. Even now some journals could be mounted on a university's own computer. Since journal issues do not change after publication, there is no reason why they could not be provided on CD-ROM and cached to a server as we in fact do with newspapers at Middlesex. This would of course provide good security for the future in terms of the cached data and the CD backup. Alternatively, third parties with the interests of libraries in mind rather than commercial publishers might mount journals on their computer systems. This can include organisations like OCLC which started as a library co-operative, is still a not for profit organisation but is now responsible for some files of journals. Other organisations might be prepared to take backfiles of electronic journals and archive them for historical purposes. The Wellcome Library for the History and Understanding of Medicine has a plan to do this for medical literature which is available only in digitised form so that the data can be preserved for prosperity. They are also planning to preserve the contents of email list archives in their area of interest so that future researchers into the history of health sciences will see what discussions were taking place in the past.

2. Electronic books

So far electronic books are not very common. The main problem is that the publisher needs to find a way of making money out of the transactions. The main player in this field is NetLibrary[8] which for a minimum fee of about £16,000 in the UK allows access to a chosen 500 titles[9]. These are accessed through the on-line catalogue and give access to one user exclusively for a set period. If you want access to a title for perpetuity you have to pay 50% of the cost price of the book plus an access charge but there is very little administration required and no shelving. So the activity is highly controlled by the technology, with users using their library card numbers. Other similar commercial services have databases which can be promoted through an index like the library catalogue; but then, on retrieving the desired item, users are sent to a webpage from where they can buy a copy of the book as a computer file with their credit cards rather than making a loan. This may not be very attractive to a library since it normally provides free access for its students to its materials. Electronic book services also include a vast resource of out of copyright material such as classical literature, which is free to anyone.

Though we can actually physically access the data, the administrative and technical infrastructures which make up the electronic world are not yet joined-up enough to make the universal database a really seamless, joined-up database.

3. Electronic secondary sources

I have left till last the electronic data of the type that came first. As long ago as 1968, secondary services or abstracting journals were moving over to being digitised. Usually a large organisation could buy tapes with references on them to mount internally which were updated at intervals. MEDLINE was the first service to make itself available over a telephone line (this was long before the world-wide web!). National Libraries prepared their catalogues in machine-readable form and in the 1970s services such as British Library's BLAISE and the Library of Congress Catalogue became available to anyone with a computer and a modem who could dial up using an ordinary phone line. We have moved on a long way from there. These resources are now usually free-of-charge with the British Library's catalogue, for example, being sponsored by the bookseller Amazon in return for easy access from the catalogue to its on-line ordering forms. We have fewer problems with the catalogues and are becoming more ambitious because our commercial interests are not so strong. Standards have been developed to allow cross-catalogue searching. You can set up many catalogue software packages to allow a user to search the Library of Congress catalogue and his own university's simultaneously. In London, eLib has funded a project to enable searching across all the university's library systems[10]. This can already be demonstrated and there is a page on the web which gives information and access to the integrated system although it is at present not quite completed.

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[8] Netlibrary is at http://www.netlibrary.com. Ebooks is at http://www.ebooks.com

[9] This was the minimum when the University of Huddersfield pioneered this in the UK, but they believe it is now possible to contract to have only 100 items at correspondingly less cost.

[10] The project is described at: http://www.M25lib.ac.uk/M25link/

Many of the specialist providers of electronic journals are providing indexes to the material they provide. You can search for anything on 'cardiac' or on the name of an author and it will retrieve the abstracts of the articles. It will allow you to see the articles if your library subscribes to the hard copy journal **and** has succeeded in setting up all the permissions. Since there are a number of different providers of these services and they all seem to have a different range of journals the situation is far from joined-up to the end user. Users can get round the problem of no access without subscription by paying for an article by credit card. But there is as yet no solution to the multiplicity of sources of this data. They still have to use the old distinct and specialised sources such as Chemical Abstracts. Sometimes these also show links to the journals in one's own library, either a note about hard copy or an actual link to the electronic version.

4. Hybrid Library

Another term has come into use, the Hybrid Library. This refers to a library with all the different kinds of media that might be used and takes into account technical and legal access issues to make the library as user-friendly as possible. There is an implication that you always use the best medium for the purpose. Materials which are available as video can be converted to computer files such as Quicktime format and made available from the same workstations as the catalogue or web-based resources. The hybrid library has been studied in research projects which have set up pilots and looked at the practicalities such as network bandwidth, equipment for terminals, security and copyright and the training necessary for both staff and students to make best use of the system. One such is the Birmingham University Integrated Library Development and Electronic Resource known as BUILDER.[11] The pilot focused on a series of six inter-related modules (user registration and induction; ordering and delivery of materials; metadata index for printed and electronic sources; teaching and learning; publication and digitisation; access gateways) which are being developed for and applied across six subject areas, history and archaeology, business, education, physics, sports science and medicine. The project is aiming to develop and encourage end-user resource discovery, in a multiplicity of formats, from a range of local and remote sources. Part of the project consists of an investigation into the better organisation and interaction of traditional library functions in the areas of collection building and document delivery. The project is also investigating the potential of the hybrid library to improve support for the students' learning experience; increase end-user awareness of, and access to, information resources; provide better application of resources and utilisation of information technology and support information professionals in their changing roles in the hybrid environment.

5. Portals

Another area which has expanded and in which JISC has been involved in is that of portals. The picture so far might imply a certain level of confusion: there are so many different resources available on the internet and hybrid libraries and institutions have set up useful links on their websites to various subject resources. Some have set up special comprehensive sets of links to resources in a particular subject known as portals. Many of these portals have been in existence for some time. ELib injected funding into others. Now the Resource Discovery Network (RDN), funded by JISC, is continuing the work. We have such websites as SOSIG (Social Science Information Gateway), HUMBUL which began as Humanities Bulletin Board, ADAM (Art, Design, Architecture and Media Gateway). Volunteers around the world have also done this on a smaller scale so there is plenty to find and link to. BUBL also exists, a general gateway including an overarching subject index which uses UDC to classify the resources to which it points. All of these have to be used with caution since they all point to each other. One of the purposes of these websites is to prevent the need for every university library to do its own website for each subject area. I am rather doubtful of this aim as all subject librarians need to do their own webpages to refer their own students to what they need which will mix websites with CD ROMs available in the library not to mention reference books and other reference materials and reading lists tailored to their particular courses.

6. Virtual Learning Environments

Another group of initiatives relates to virtual learning environments (VLE). We have moved out of the library back to the university (almost into the classroom) as the VLE is in the realm of educational technology. Perhaps every VLE needs a hybrid library. Academics have always provided reading lists and special course materials. In the distance learning environment these have to be accessible from afar. There are many

[11] Information of BUILDER can be found on a web site at http://builder.bham.ac.uk/.

packages which can provide this and Middlesex University is hoping to have WebCT[12]. Packages like this make the environment easier to operate and control. The materials available are accessible only to students with the correct login. This also requires management by university staff and student users alike and it is therefore also known as the managed learning environment. Students can do self assessed tests or interactive tests which the computer can validate. Of course these materials are not easy to develop. Staff need training to make them and to make them well. There are also opportunities to link in with the virtual library. Do you access this material through a VLE catalogue based on your courses and can you also find the materials in the library catalogue? If there is a reading list in the VLE materials can it be linked to the catalogue so that you can see if a book is on the shelves. The student wants everything to be joined up: one login from one computer workstation which will allow easy access to all the resources the university has access to and which he needs, with suitable direction in finding them in this amorphous mass of information. What we do not want is for any unnecessary obstacles to be placed in the way, such as technical or legal.

The future

In the UK we have an organisation called SCONUL which is a membership organisation of 157 library and information services in the UK and Ireland. Its members include not only libraries in higher education but also the British Library and the National Libraries of Ireland, Scotland and Wales and libraries in some national museums and other specialist institutions. They recently set up a group of chief librarians which held a workshop, consulted colleagues and then reported in a document entitled *SCONUL vision*[13]. I can do no better than quote a paragraph from this report which you should read for yourselves.

> Our vision for 2005 is not radically different to our previous view of 2002, but there are a few elements that have become more prominent in line with our perceptions of environmental forces. For example, we see web portals developing significantly in the context of managed information environments and formal partnerships underpinning cross-sectoral and multi-national consortia. Both learning and research support will have to be organised on a distributed model to reflect student and staff modes of working, but will need to be delivered as a seamless system, integrating local, regional, national and global resources. As boundaries between functions become increasingly fluid, we can expect staff roles to evolve and expand – or contract – according to institutional circumstances. There will be opportunities to act as rights managers, learning advisers and cross-disciplinary brokers for those who can demonstrate their competence to do so. The 'library' will retain its importance as a physical place and will be able to consolidate its position by bringing related services into its space.

In this paper I have discussed the state-of-the-art as it purports to be at the moment. In actual fact, this picture I have painted, successes and problems, is already somewhat futuristic as far as many students are concerned. Students are all familiar with the World Wide Web. They probably do not make very systematic use of it. They all make extensive use of email. But as far as their use of library materials is concerned, many of them are doing little more than using an electronic library catalogue to find printed books on the shelves in their own library. We expect this to change for reasons stated above and summarised here:

- Economical reasons (for both library and publisher) will ensure that the University of the 21st century moves from print to electronic in areas such as reference works.
- Improvements to technology will make it easier to use
- Experience of these media will increase, particularly as new students at university will have already become familiar with new technologies as they are introduced into education from the age of 5 and even earlier.

Whether the services can become more joined-up to provide ease of access to the students and efficiencies leading to economies of operations for the administration of the university learning resources services remains to be seen. As I hinted earlier copyright and commercial interests are not always leading in the direction that librarians would wish for the benefit of their users.

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[12] WebCT has a homepage at http://www.webct.com

[13] Corrall, Sheila *The SCONUL Vision: the academic library in the year 2005.* London: SCONUL, 2001, 6 p. Also at: http://www.sconul.ac.uk/vision2005.htm